

**EMBEDDING AND ENCAPSULATION OF SENSITIVE
COMPONENTS INTO A MATRIX TO OBTAIN DISCRETE
CONTROLLED RELEASE PARTICLES**

ABSTRACT OF THE DISCLOSURE

5 Controlled release, discrete, solid particles which contain an encapsulated
and/or embedded component such as a heat sensitive or readily oxidizable
pharmaceutically, biologically, or nutritionally active component are
continuously produced without substantial destruction of the matrix material or
encapsulant. A release-rate controlling component is incorporated into the
10 matrix to control the rate of release of the encapsulant from the particles. The
additional component may be a hydrophobic component or a high water binding
capacity component for extending the release time. The plasticizable matrix
material, such as starch, is admixed with at least one plasticizer, such as water,
and at least one release-rate controlling component under low shear mixing
15 conditions to plasticize the plasticizable material without substantially destroying
the at least one plasticizable material and to obtain a substantially homogeneous
plasticized mass. The plasticizer content is substantially reduced and the
temperature of the plasticized mass are substantially reduced prior to admixing
the plasticized mass with the encapsulant to avoid substantial destruction of the
20 encapsulant and to obtain a formable, extrudable mixture. The mixture is
extruded through a die without substantial or essentially no expansion and cut
into discrete, relatively dense particles. Release properties may also be
controlled by precoating the encapsulant and/or coating the extrudate particles
with a film-forming component.